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**Cho**

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(54) **INSPECTION MANAGING APPARATUS,  
INSPECTION SYSTEM, AND INSPECTION  
METHOD FOR INTEGRATED MULTIMEDIA  
OF VEHICLE**

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**G07C 5/00** (2006.01)

(52) **U.S. Cl.**

CPC ..... **G07C 5/08** (2013.01); **G05B 23/021**  
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**67/12** (2013.01); **H04W 24/00** (2013.01);  
**G07C 5/008** (2013.01); **G07C 2205/02**  
(2013.01)

(58) **Field of Classification Search**

None

See application file for complete search history.

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(57) **ABSTRACT**

An inspection system for an integrated multimedia of a vehicle includes: a wireless connector mounted in the vehicle; and a communication terminal requesting pairing with the integrated multimedia of the vehicle through a short range wireless communication using the wireless connector, and determining at least one of whether a phonebook is transmitted, whether a call sound is transmitted and received, and whether short range wireless communication is performed, by inspecting the integrated multimedia for the vehicle in the state in which the communication terminal is paired with the integrated multimedia of the vehicle through the short range wireless communication.

**18 Claims, 6 Drawing Sheets**

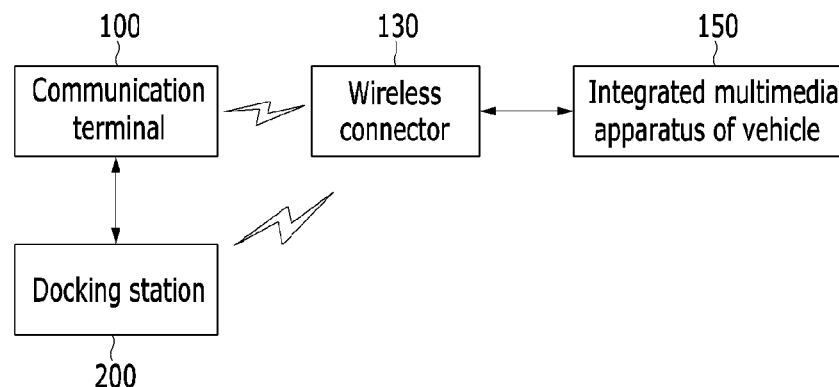


FIG. 1

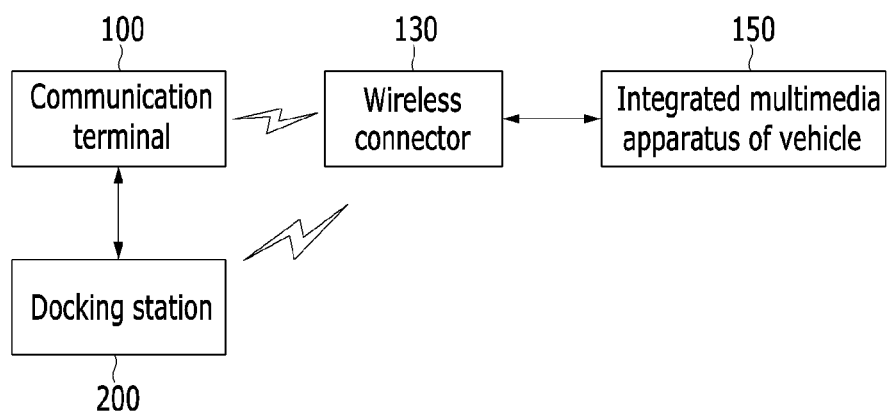


FIG. 2

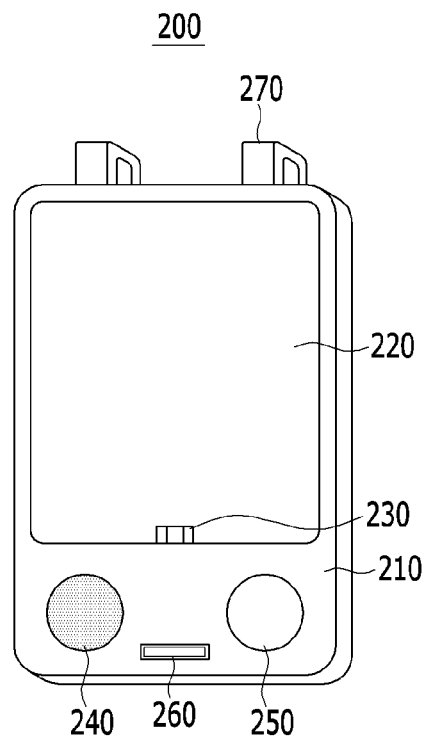


FIG. 3

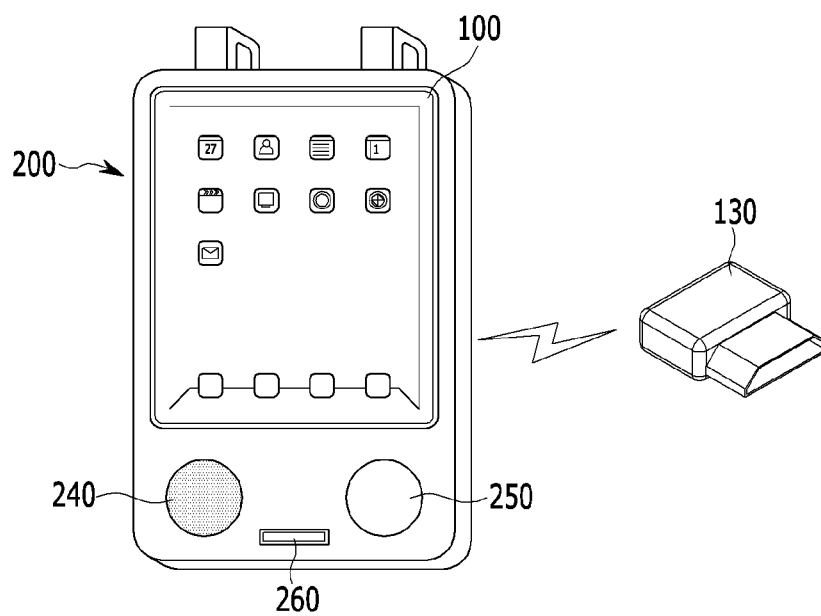


FIG. 4

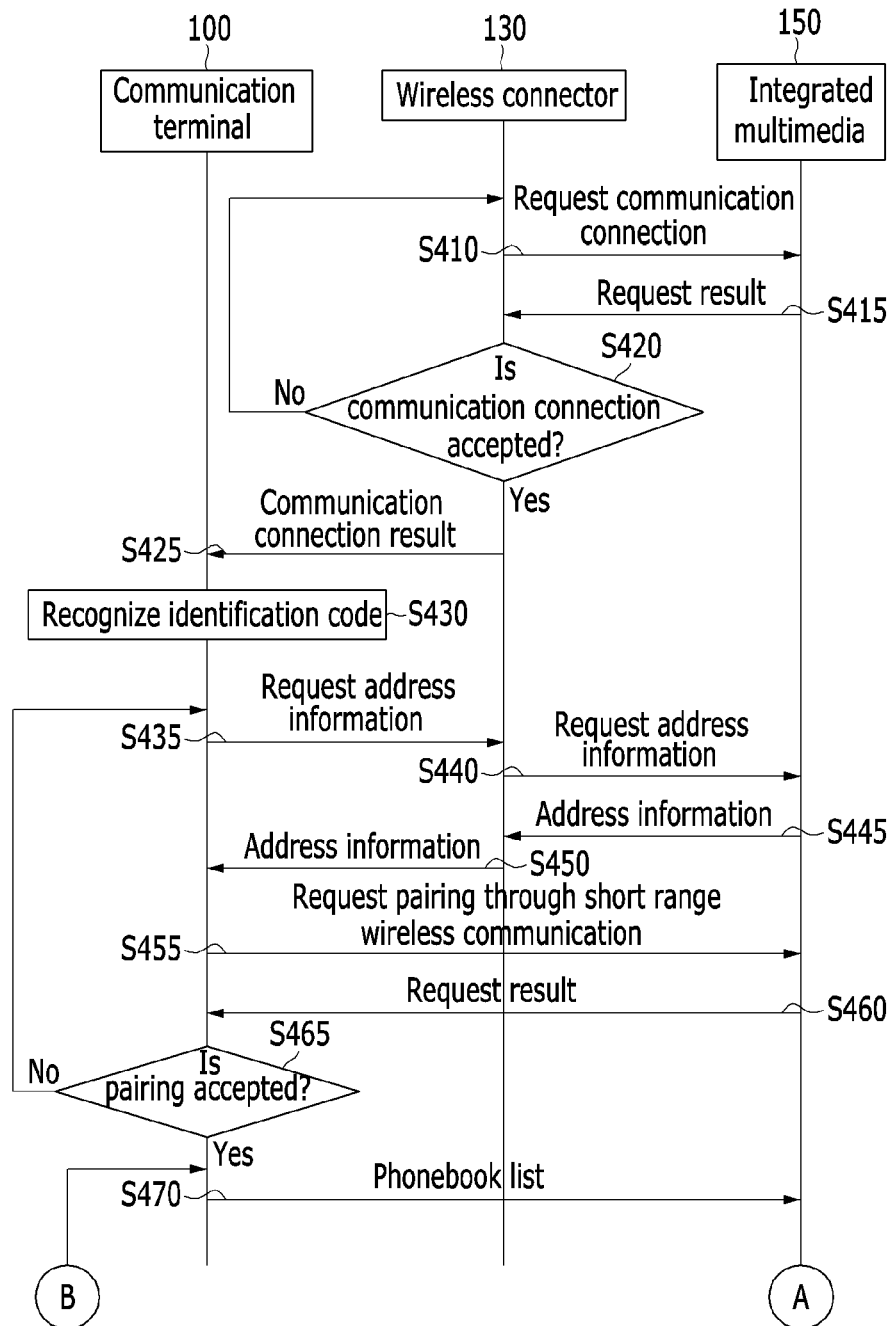


FIG. 5

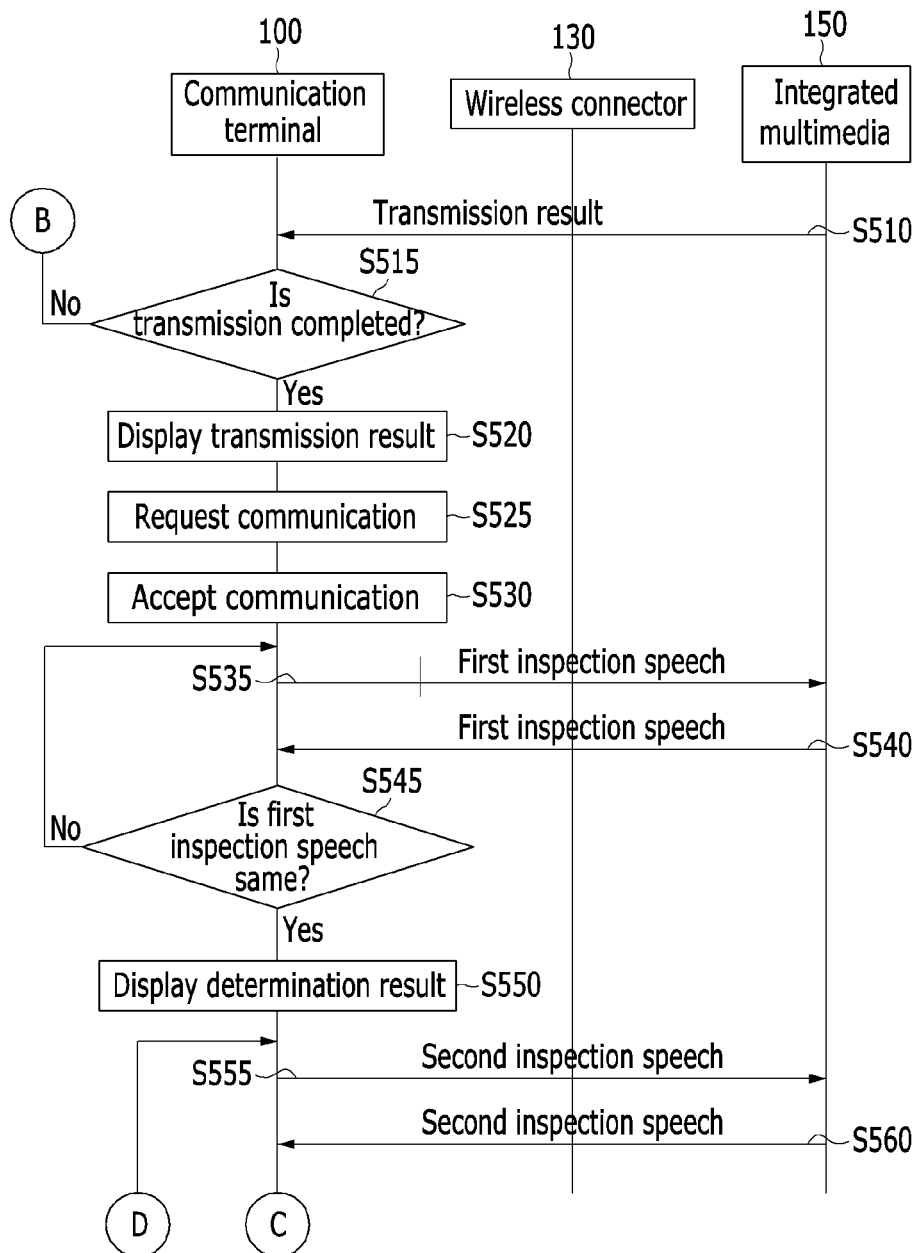
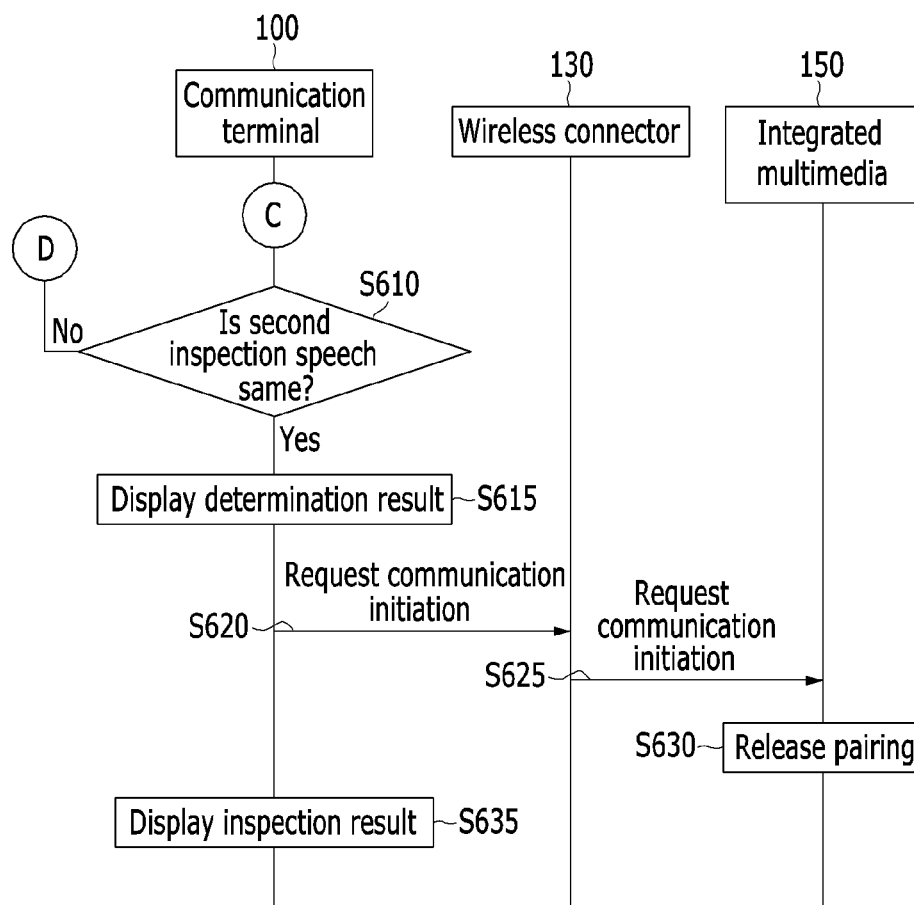


FIG. 6



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# INSPECTION MANAGING APPARATUS, INSPECTION SYSTEM, AND INSPECTION METHOD FOR INTEGRATED MULTIMEDIA OF VEHICLE

## CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of priority to Korean Patent Application No. 10-2014-0066367 filed in the Korean Intellectual Property Office on May 30, 2014, the entire contents of which are incorporated herein by reference.

## FIELD OF THE INVENTION

The present disclosure relates to an inspection system for an integrated multimedia of a vehicle, and more particularly, to an inspection managing apparatus, an inspection system, and an inspection method in which a short range wireless communication and speech recognition function of an integrated multimedia of a vehicle is inspected using an inspection process.

## BACKGROUND

Recently, due to the significant development of electronic devices, control of the electronic devices plays an important role in improving performance of a vehicle. The developed electronic devices have been applied to a safety apparatus for substantially driving an engine or promoting safety of a driver, several additional pieces of equipment for a driver's convenience, a driving apparatus, and the like.

For driver's convenience and a comfortable driving state, integrated multimedia of a vehicle in which audio video navigation (AVN) is integrated has been rapidly distributed recently.

The integrated multimedia of the vehicle is a device in which an audio device, a video device, a navigation device, and the like are integrated within the vehicle and may be accessed through a common user interface, and provide an audio service such as radio and CD, a video service such as DVD, a navigation service such as a destination guide function, and the like.

The integrated multimedia of the vehicle is configured to share a speaker, a display device, a key input unit, and the like which are user interfaces for the audio service, the video service, and the navigation service. Compared to a case in which the audio device, the video device, and the navigation device are individually provided, the integrated multimedia of the vehicle has several advantages, such as removal of overlapping parts, driver's operation convenience, and an integrated service.

Further, the integrated multimedia of the vehicle supports a handsfree call of mobile communication terminals such as a smart phone within the vehicle to help a driver talk on the phone while driving. To this end, the integrated multimedia of the vehicle includes a communication device which may perform short range wireless communication such as Bluetooth to allow the driver to conveniently perform communications in a handsfree mode.

A quality problem of the short range wireless communication and speech recognition function of the integrated multimedia of the vehicle among quality problems relating to a recently emerging vehicle electronic technology is on the increase. A need exists to improve the quality problem and the like.

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However, it is difficult to completely solve the above problem only by improvement of the technology, so it is necessary to perform inspection in a vehicle state in which assembling is completed. However, according to the existing inspection method, an inspector manually performs all the operations which control the terminal providing the short range wireless communication and the integrated multimedia of the vehicle so as to perform the inspection. Therefore, since the existing inspection method involves complicated manual operations for performing the inspection and a long inspection time, the existing inspection method omits or simplifies the inspection and therefore does not normally perform the inspection.

The above information disclosed in this Background section is only for enhancement of understanding of the background of the invention and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

## SUMMARY

An aspect of the present inventive concept provides an inspection managing apparatus, an inspection system, and an inspection method for integrated multimedia of a vehicle capable of inspecting a short range wireless communication and speech recognition function of the integrated multimedia apparatus of the vehicle using an inspection process.

Another aspect of the present inventive concept provides an inspection managing apparatus, an inspection system, and an inspection method for integrated multimedia of a vehicle capable of automatically inspecting the integrated multimedia of the vehicle by fixing a communication terminal to the vehicle.

Still another aspect of the present inventive concept encompasses an inspection managing apparatus, an inspection system, and an inspection method for integrated multimedia of a vehicle capable of storing and managing an inspection result of the integrated multimedia of the vehicle in a communication terminal.

An exemplary embodiment of the present inventive concept relates an inspection system for integrated multimedia of a vehicle, including: a wireless connector mounted in the vehicle; and a communication terminal requesting pairing with the integrated multimedia of the vehicle through a short range wireless communication using the wireless connector, and determining at least one of whether a phonebook is transmitted, whether a call sound is transmitted and received, and whether short range wireless communication is performed, by inspecting the integrated multimedia of the vehicle in the state in which the communication terminal is paired with the integrated multimedia of the vehicle through the short range wireless communication.

Another exemplary embodiment of the present inventive concept provides an inspection managing apparatus for integrated multimedia of a vehicle, including: a wireless connector mounted in the vehicle; a docking station mounted in the docking station, requesting pairing with the integrated multimedia of the vehicle through the short range wireless communication using the wireless connector, and inspecting the integrated multimedia of the vehicle in a state in which the communication terminal is paired with the integrated multimedia of the vehicle through the short range wireless communication.

Yet another exemplary embodiment of the present inventive concept provides an inspection method for integrated multimedia of a vehicle by a communication terminal,



including: requesting pairing with the integrated multimedia of the vehicle through short range wireless communication using a wireless connector; when the pairing is accepted through the short range wireless communication, performing the pairing with the integrated multimedia of the vehicle through the short range wireless communication; transmitting a phonebook list to the integrated multimedia of the vehicle to determine whether a phonebook may be transmitted; outputting a first inspection speech in a call connected state with an arbitrary telephone number in the phonebook list and determining whether a call sound is transmitted and received based on the first inspection speech; outputting a second inspection speech to the integrated multimedia of the vehicle through the short range wireless communication and determining whether the short range wireless communication may be performed based on the second inspection speech; and releasing pairing with the integrated multimedia of the vehicle through the short range wireless communication.

According to the inspection managing apparatus, the inspection system, and the inspection method for the integrated multimedia of the vehicle according to the exemplary embodiments of the present inventive concept, it is possible to automatically inspect the short range wireless communication and speech recognition function of the integrated multimedia apparatus of the vehicle using the inspection process, thereby rapidly and accurately performing the inspection.

Further, according to the inspection managing apparatus, the inspection system, and the inspection method for the integrated multimedia of the vehicle according to the exemplary embodiments of the present inventive concept, it is possible to previously prevent the field leakage which is the quality problem relating to the short range wireless communication and speech recognition function by inspecting the integrated multimedia within the completed vehicle.

Further, according to the inspection managing apparatus, the inspection system, and the inspection method for the integrated multimedia of the vehicle according to the exemplary embodiments of the present inventive concept, it is possible to store and manage the inspection result of the integrated multimedia of the vehicle in the communication terminal, thereby facilitating the inspection history management.

Further, the effects which may be obtained or predicted by the exemplary embodiment of the present inventive concept will be directly or implicitly disclosed in the detailed description.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram schematically illustrating an inspection system for integrated multimedia of a vehicle according to an exemplary embodiment of the present inventive concept.

FIG. 2 is a diagram illustrating a docking station according to an exemplary embodiment of the present inventive concept.

FIG. 3 is a diagram illustrating an inspection managing apparatus for integrated multimedia of a vehicle according to an exemplary embodiment of the present inventive concept.

FIGS. 4 to 6 are flowcharts illustrating an inspection method for an integrated multimedia of a vehicle according to an exemplary embodiment of the present inventive concept.

#### DETAILED DESCRIPTION OF THE EMBODIMENTS

Hereinafter, an operation principle of an inspection managing apparatus, an inspection system, and an inspection method for an integrated multimedia of a vehicle according to an exemplary embodiment of the present inventive concept will be described in detail with reference to the descriptions and the accompanying drawings. However, the drawings and the detailed description relate to one exemplary embodiment among several exemplary embodiments for effectively describing features of the present invention inventive concept. Therefore, the present inventive concept is not limited only to the drawings and description.

Further, in describing below exemplary embodiments of the present inventive concept, the related well-known functions or constructions will not be described in detail since they may unnecessarily obscure the understanding of the present inventive concept. Further, the following terminologies are defined in consideration of the functions in the present inventive concept and may be construed in different ways by the intention of users and operators, practice, or the like. Therefore, the definitions thereof should be construed based on the contents throughout the specification.

Further, to effectively describe core technical features of the present invention, terms may be appropriately changed, integrated, or separated for those skilled in the art in a technical field to which the present inventive concept belongs to explicitly understand the present invention, but the present invention is not limited thereto.

Hereinafter, one exemplary embodiment of the present inventive concept will be described in detail with reference to the accompanying drawings.

FIG. 1 is a diagram schematically illustrating an inspection system for integrated multimedia of a vehicle according to an exemplary embodiment of the present inventive concept.

Referring to FIG. 1, an inspection system for integrated multimedia of a vehicle includes a communication terminal **100** and a wireless connector **130**. The inspection system is connected to the integrated multimedia of a vehicle (hereinafter referred to as "integrated multimedia" **150**).

The communication terminal **100** is mounted in the vehicle through a docking station **200** to inspect the integrated multimedia **150**. The docking station **200** will be described in detail with reference to FIG. 2.

The communication terminal **100** is connected to the wireless connector **130** to request address information on the integrated multimedia **150**, and is connected to the integrated multimedia **150** by using the address information on the integrated multimedia **150** which is received from the wireless connector **130**.

The communication terminal **100** may be connected to the integrated multimedia **150** through a short range wireless communication. Herein, the short range wireless communication may be at least one of Bluetooth, infrared data association (IrDA), WiFi, wireless LAN, radio frequency (RF), near field communication (NFC), and ZigBee.

The communication terminal **100** transmits a phonebook list to the integrated multimedia **150** to determine whether the phonebook may be transmitted.

The communication terminal **100** connects a call using an arbitrary phone number of the phonebook list, outputs first inspection speech to the integrated multimedia **150** in a call connected state, and receives the first inspection speech from the integrated multimedia **150**. The communication terminal **100** uses the output first inspection speech and the received

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first inspection speech to determine whether a call sound may be transmitted and received.

The communication terminal **100** outputs a second inspection speech in the state in which the communication terminal **100** is paired with the integrated multimedia **150** through the short range wireless communication, and receives the second inspection speech from the integrated multimedia **150**. The communication terminal **100** uses the output second inspection speech and the received second inspection speech to determine whether the short range wireless communication may be performed.

The inspection method of the integrated multimedia **150** in the communication terminal **100** will be described in more detail with reference to FIGS. **4** to **6**.

When the communication terminal **100** performs communication while being connected to the wireless connector **130** and the integrated multimedia **150**, the communication terminal **100** has various forms. For example, the communication terminal **100** may be any one of a mobile phone which may perform voice communication or image communication, such as a wideband CDMA (WCDMA) phone and a smart phone, a tablet PC, an e-book, and a personal digital assistants (PDA).

The wireless connector **130** is mounted in the vehicle and is connected to the communication terminal **100** and the integrated multimedia **150**. That is, when the wireless connector **130** is mounted in the vehicle, the wireless connector **130** requests a connection of the integrated multimedia **150**, and when the connection is accepted, the wireless connector **130** may be connected to the integrated multimedia **150** through a controller area network (CAN) communication network.

The wireless connector **130** is connected to the communication terminal **100** through the short range wireless communication.

The wireless connector **130** receives an address information request of the integrated multimedia **150** from the communication terminal **100**, and requests the address information of the integrated multimedia **150**. The wireless connector **130** receives the address information from the integrated multimedia **150** and transmits the received address information of the integrated multimedia **150** to the communication terminal **100**.

The wireless connector **130** may be a wireless on-board diagnostics (OBD) connector.

The integrated multimedia **150** is mounted in the vehicle and may be configured by integrating an audio video navigation (AVN).

The integrated multimedia **150** is connected to the wireless connector **130** and the communication terminal **100**. That is, the integrated multimedia **150** may be connected to the wireless connector **130** through the CAN communication network. The integrated multimedia **150** may be connected to the communication terminal **100** through the short range wireless communication.

The integrated multimedia **150** receives the phonebook list from the communication terminal **100** in the state in which the integrated multimedia **150** is paired with the communication terminal **100** through the short range wireless communication. The integrated multimedia **150** may display the received phone book list on a screen.

The integrated multimedia **150** receives the inspection speech in the state in which the integrated multimedia **10** is paired with the communication terminal **100** through the short range wireless communication and transmits the received inspection speech to the communication terminal **100**.

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The integrated multimedia **150** releases the pairing with the communication terminal through the short range wireless communication when the inspection in the communication terminal **100** is completed.

FIG. **2** is a diagram illustrating a docking station according to an exemplary embodiment of the present inventive concept.

Referring to FIG. **2**, a docking station **200** includes a main body **210**, a seating part **220**, a connection terminal **230**, a speaker **240**, a microphone **250**, a code recognition unit **260**, and a stand **270**.

The main body **210** is provided with the seating part **220**, the connection terminal **230**, the speaker **240**, the microphone **250**, the code recognition unit **260**, and the stand **270**.

The main body **210** may have a quadrangle shape, but is not limited thereto, but has a different shape. For example, the main body **210** may have a polygon, a circle, and an oval shape.

The seating part **220** is formed in the main body **210** and is provided with the communication terminal **100**. The seating part **220** may be formed in a groove form in the main body **210** so as to be provided with the communication terminal **100**.

A size of the seating part **220** may be differently formed depending on a size of an outer side of the communication terminal **100**.

The connection terminal **230** is formed at a lower end of the seating part **220**. The connection terminal **230** is inserted into the communication terminal **100** to fix the communication terminal **100** to the seating part **220**. The connection terminal **230** connects among the communication terminal **100**, the speaker **240**, and the microphone **250**.

The speaker **240** is formed at one side of the main body **210**. For example, the speaker **240** may be formed at the lower end of the seating part **220**, but may be formed at another location. That is, the location of the speaker **240** in the main body **210** is not limited.

The speaker **240** may output the inspection speech under the control of the communication terminal **100** connected through the connection terminal **230**.

The microphone **250** is formed at one side of the main body **210**. For example, the microphone **250** may be formed at the lower end of the seating part **220** and may be formed to be symmetrical with the speaker **240**, but is not limited thereto. That is, the location of the microphone **250** in the main body **210** is not limited.

The microphone **250** receives the inspection speech output from the outside, and may provide the received inspection speech to the communication terminal **100** through the connection terminal **230** under the control of the communication terminal **100**.

The code recognition unit **260** is formed in the main body **210** and recognizes an identification code of the vehicle. The code recognition unit **260** may provide the recognized identification code to the communication terminal **100** through the connection terminal **230**.

The code recognition unit **260** may be formed at the lower end of the main body **210** at which the speaker **240** and the microphone **250** are formed, but is not limited thereto. That is, the location of the code recognition unit **260** in the main body **210** is not limited.

The stand **270** fixes the main body **210** to the vehicle. The stand **270** may be formed to be locked to a handle of the vehicle.

The stand **270** is formed on an upper portion of the main body **210** and may be formed of two thereof, but is not limited thereto. That is, when the stand **270** fixes the main

body **210** to the vehicle, the stand **270** may also be formed at a lower portion of the main body **210**, both sides of the main body **210**, and upper and lower portions of the main body **210**, and when the stand **270** fixes the main body **210** to the vehicle, the number of stands **270** is not limited.

FIG. **3** is a diagram illustrating an inspection managing apparatus for integrated multimedia of a vehicle according to an exemplary embodiment of the present inventive concept.

Referring to FIG. **3**, the inspection managing apparatus includes the communication terminal **100**, the docking station **200**, and the wireless connector **130**.

The communication terminal **100** is mounted in the docking station **200** and may control the speaker **240**, the microphone **250**, and the code recognition unit **260** of the docking station **200** to inspect the integrated multimedia **150**.

In other words, the communication terminal **100** recognizes the identification code of the vehicle through the code recognition unit **260**. Here, the identification code of the vehicle may be a vehicle identification number (VIN) of the vehicle. For example, the identification code may be a one-dimensional barcode or a two-dimensional barcode. The two-dimensional barcode may be one of a quick response (QR) code, a Maxi code, a data matrix code, and PDF417.

When the communication terminal **100** requests a connection with the integrated multimedia **150** through the wireless connector **130** and receives acceptance for the connection request from the wireless connector **130**, the communication terminal **100** is paired with the integrated multimedia **150** through the short range wireless communication.

The communication terminal **100** outputs the inspection speech through the speaker **240** of the docking station **200**, and receives the inspection speech through the microphone **250**. The communication terminal **100** compares the output inspection speech and the received inspection speech to determine whether the call sound may be transmitted and received, whether the short range wireless communication may be performed, and whether the communication may be performed through the short range wireless communication.

The communication terminal **100** stores inspection results for each identification code of the vehicle to be able to manage an inspection history.

The docking station **200** fixes the communication terminal **100** to the vehicle. The docking station **200** includes the speaker **240** outputting the inspection speech, the microphone **250** receiving the inspection speech, and the code recognition unit **260** recognizing the identification code of the vehicle under the control of the communication terminal.

The wireless connector **130** is mounted in the vehicle, and is connected to the communication terminal **100** and the integrated multimedia **150**. The wireless connector **130** receives the address information request of the integrated multimedia **150** from the communication terminal **100**, and requests the address information of the integrated multimedia **150**. The wireless connector **130** receives the address information from the integrated multimedia **150** and transmits the received address information to the communication terminal **100**.

FIGS. **4** to **6** are flowcharts illustrating an inspection method for integrated multimedia of a vehicle according to an exemplary embodiment of the present inventive concept.

Referring to FIGS. **4** to **6**, the wireless connector **130** is mounted in the vehicle. It is determined that the wireless connector **130** is mounted in the vehicle, and the wireless

connector **130** requests the communication connection of the integrated multimedia **150** which is formed in the vehicle (**S410**).

The integrated multimedia **150** receives a communication establishment request from the wireless connector **130**, and accepts the communication connection to transmit the request result to the wireless connector **130** (**S415**).

The wireless connector **130** determines whether the request result is the acceptance of the communication request (**S420**).

When the communication request is not accepted, the wireless connector **130** returns to step **S410** to again request the communication connection.

When the communication request is accepted, the wireless connector **130** is connected to the integrated multimedia **150** through the CAN communication network. The wireless connector **130** is connected to the communication terminal **100** through the short range wireless communication. The wireless connector **130** transmits the communication connection result that the wireless connector **130** is communication-connected to the integrated multimedia **150** to the communication terminal **100** (**S425**).

The communication terminal **100** recognizes the identification code of the vehicle through the code recognition unit **260** of the docking station **200** (**S430**). Further, when an operator selects a start button, the communication terminal **100** confirms the input for the start button and starts the inspection of the integrated multimedia **150**.

The communication terminal **100** requests the address information on the integrated multimedia **150** of the wireless connector **130** so that the communication terminal **100** is connected to the integrated multimedia **150** through the short range wireless communication (**S435**). In this case, the address information may be a media access control (MAC) address.

The wireless connector **130** receives the address information request from the communication terminal **100** and requests the address information of the integrated multimedia **150** (**S440**).

The integrated multimedia **150** transmits the address information to the wireless connector **130** (**S445**).

The wireless connector **130** receives the address information from the integrated multimedia **150** and transmits the received address information on the integrated multimedia **150** to the communication terminal **100** (**S450**).

The communication terminal **100** receives the address information on the integrated multimedia **150** from the wireless connector **130**, and requests the pairing with the integrated multimedia **150** through the short range wireless communication using the address information (**S455**).

The integrated multimedia **150** receives the pairing request from the communication terminal **100** and transmits the request result for the pairing request to the communication terminal **100** (**S460**). The integrated multimedia **150** may transmit the request result accepting the pairing request to the communication terminal **100**.

The communication terminal **100** receives the request result from the integrated multimedia **150** and determines whether the request result corresponds to the acceptance of pairing (**S465**).

When the pairing request is not accepted or the request result is not received, the communication terminal **100** returns to step **S435** to again request the address information on the integrated multimedia **150** of the wireless connector **130**.

When the pairing request is accepted, the communication terminal **100** is paired with the integrated multimedia **150**.

through the short range wireless communication. The communication terminal **100** transmits the phonebook list to the integrated multimedia **150** through the short range wireless communication (S470). In this case, the phonebook list may include at least one phone number.

The integrated multimedia **150** receives the phonebook list from the communication terminal **100**, and transmits a transmission result to the communication terminal **100** to inform the communication terminal **100** that the phonebook list is received (S510).

The communication terminal **100** determines whether the transmission result is the transmission completion of the phonebook list (S515).

When the transmission of the phonebook list is not completed, the communication terminal **100** returns to step S470 to again transmit the phonebook list to the integrated multimedia **150**.

When the transmission of the phonebook list is completed, the communication terminal **100** displays the transmission result that the integrated multimedia **150** receives the phonebook list on the screen (S520). In this case, the communication terminal **100** may store the transmission result for the phonebook list.

The communication terminal **100** requests a call using an arbitrary phone number of the phonebook list (S525).

The communication terminal **100** accepts a call through the short range wireless communication (S530).

The communication terminal **100** transmits the first inspection speech to the microphone of the vehicle through the speaker **240** of the docking station in the call connected state (S535). In this case, the communication terminal **100** releases the pairing with the integrated multimedia through the short range wireless communication and outputs the first inspection speech, and then performs the pairing with the integrated multimedia through the short range wireless communication again.

The integrated multimedia **150** recognizes the first inspection speech received by the microphone of the vehicle, and transmits the first inspection speech to the communication terminal **100** through the short range wireless communication (S540).

The communication terminal **100** receives the first inspection speech through the short range wireless communication, and compares the output first inspection speech with the received first inspection speech to determine whether the output first inspection speech is the same as the received first inspection speech (S545).

When the communication terminal **100** compares the output first inspection speech with the received first inspection speech to determine whether the output first inspection speech is the same as the received first inspection speech, the communication terminal **100** displays the determination result on the screen (S550). That is, when the communication terminal **100** compares the output first inspection speech with the received first inspection speech to determine whether the output first inspection speech is the same as the received first inspection speech, the communication terminal may determine that the call and the call sound may be transmitted and received and may display the determination result on the screen. Further, when the communication terminal **100** compares the output first inspection speech with the received first inspection speech to determine whether the output first inspection speech is the same as the received first inspection speech, the communication terminal outputs the first inspection speech through the microphone of the vehicle and therefore may confirm the performance of the microphone of the vehicle. Further, the communication

terminal **100** may store the determination result for the identification code of the vehicle.

When the output first inspection speech is not the same as the received first inspection speech, the communication terminal **100** returns to step S540 to again transmit the first inspection speech to the integrated multimedia **150**.

The communication terminal **100** outputs the second inspection speech through the speaker **240** of the docking station **200** in the state in which the communication terminal **100** is paired with the integrated multimedia through the short range wireless communication (S555). In this case, the communication terminal **100** releases the pairing with the integrated multimedia through the short range wireless communication and outputs a second inspection speech, and then performs the pairing with the integrated multimedia through the short range wireless communication again.

The integrated multimedia **150** receives the second inspection speech through the short range wireless communication and outputs the second inspection speech through the speaker of the vehicle (S560).

The communication terminal **100** compares the output second inspection speech with the received second inspection speech to determine whether the output second inspection speech is the same as the received second inspection speech (S610).

When the output second inspection speech is not the same as the received second inspection speech by comparing the output second inspection speech with the received second inspection speech, the communication terminal **100** returns to step S555 to again transmit the second inspection speech to the integrated multimedia **150**.

When the communication terminal **100** compares the output second inspection speech with the received second inspection speech to determine whether the output second inspection speech is the same as the received second inspection speech, the communication terminal **100** displays the determination result on the screen (S615). That is, when the output second inspection speech is the same as the received second inspection speech by comparing the output second inspection speech with the received second inspection speech, the communication terminal **100** may determine that the short range wireless communication may be performed and performs the comparison based on the inspection speech output through the speaker of the vehicle to be able to confirm the performance of the speaker of the vehicle. Further, the communication terminal **100** may store the determination result for the identification code of the vehicle.

The communication terminal **100** requests initialization of the short range wireless communication of the wireless connector **130** (S620).

The wireless connector **130** receives the communication initialization request from the communication terminal **100** and transmits the communication initialization request to the integrated multimedia **150** (S625).

The integrated multimedia **150** releases the pairing with the communication terminal **100** through the short range wireless communication (S630).

The communication terminal **100** displays the inspection result including the plurality of determination results corresponding to the identification code of the vehicle (S635). Further, the communication terminal **100** may also transmit the inspection result corresponding to the identification code to the upper managing apparatus which manages the communication terminal **100**. Therefore, the operator may also confirm the inspection result of inspection for each vehicle

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by the upper managing apparatus, and therefore the operation management may be easily performed.

Further, the operator separates the docking station **200** in which the wireless connector **130** and the communication terminal **100** are mounted from the vehicle, and then may complete the inspection.

While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims.

What is claimed is:

1. An inspection system for integrated multimedia of a vehicle, comprising:

a wireless connector mounted in the vehicle; and  
a communication terminal (i) requesting pairing with the integrated multimedia of the vehicle through a short range wireless communication using the wireless connector, and (ii) determining at least one of whether a phonebook is transmitted, whether a call sound is transmitted and received, and whether short range wireless communication is performed, by inspecting the integrated multimedia for the vehicle while the communication terminal is paired with the integrated multimedia of the vehicle through the short range wireless communication,

wherein the communication terminal (i) requests a call using an arbitrary phone number in a phonebook list, (ii) accepts a call through the short range wireless communication, (ii) outputs a first inspection speech to the microphone of the vehicle through the speaker of the docking station in a call connected state, (iv) receives the first inspection speech through the microphone of the docking station in the state in which the communication terminal is paired with the integrated multimedia through the short range wireless communication, and (v) compares the output first inspection speech with the received first inspection speech to determine whether the call sound is transmitted and received.

2. The inspection system of claim 1, further comprising: a docking station on which the communication terminal is mounted and which fixes the communication terminal to the vehicle.

3. The inspection system of claim 2, wherein the docking station includes:  
a speaker outputting inspection speech under control of the communication terminal; and  
a microphone receiving the inspection speech from the integrated multimedia of the vehicle.

4. The inspection system of claim 3, wherein the communication terminal transmits the phonebook list to the integrated multimedia of the vehicle to determine whether the phonebook is transmitted.

5. The inspection system of claim 3, wherein the communication terminal (i) outputs a second inspection speech through the speaker of the docking station in the state in which the communication terminal is paired with the integrated multimedia of the vehicle through the short range wireless communication, (ii) receives the second inspection speech by the microphone of the docking station through the speaker of the vehicle, and (iii) compares the output second inspection

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speech with the received second inspection speech to determine whether the short range wireless communication is performed.

6. The inspection system of claim 1, wherein the wireless connector (i) requests address information of the integrated multimedia of the vehicle, (ii) receives the address information from the integrated multimedia of the vehicle, and (iii) transmits the address information to the communication terminal when the wireless connector receives an address information request of the integrated multimedia of the vehicle from the communication terminal.

7. The inspection system of claim 1, wherein the communication terminal receives an identification code of the vehicle through a code recognition unit of the docking station and stores and manages inspection results for each identification code.

8. An inspection managing apparatus for integrated multimedia of a vehicle, comprising:

a wireless connector mounted in the vehicle;  
a docking station mounted in the vehicle; and  
a communication terminal mounted in the docking station, requesting pairing with the integrated multimedia of the vehicle through a short range wireless communication using the wireless connector, and inspecting the integrated multimedia of the vehicle in a state in which the communication terminal is paired with the integrated multimedia of the vehicle through the short range wireless communication,

wherein the communication terminal (i) transmits a phonebook list to the integrated multimedia of the vehicle to determine whether the phonebook is transmitted, (ii) outputs a first inspection speech to the integrated multimedia of the vehicle in a call connected state with an arbitrary telephone number in the phonebook list, (iii) determines whether a call sound is transmitted and received based on the first inspection speech, (iv) outputs a second inspection speech to the integrated multimedia of the vehicle in a state in which the communication terminal is paired with the integrated multimedia of the vehicle through the short range wireless communication, and (v) determines whether the short range wireless communication is performed based on the second inspection speech.

9. The inspection managing apparatus of claim 8, wherein the docking station includes:

a main body having a seating part on which the communication terminal is mounted;  
a microphone formed at the main body;  
a speaker formed at the main body; and  
a stand fixing the main body to the vehicle.

10. The inspection managing apparatus of claim 9, wherein

the docking station further includes a connection terminal which is formed at a lower end of the seating part and connects among the microphone, the speaker, and the communication terminal.

11. The inspection managing apparatus of claim 9, wherein

the docking station further includes a code recognition unit which is formed at one side of the main body and recognizes an identification code for the vehicle.

12. An inspection method for integrated multimedia of a vehicle by a communication terminal, comprising steps of:  
requesting pairing with the integrated multimedia of the vehicle through a short range wireless communication using a wireless connector;

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performing the pairing with the integrated multimedia of the vehicle through the short range wireless communication when the pairing is accepted through the short range wireless communication;

transmitting a phonebook list to the integrated multimedia for the vehicle to determine whether a phonebook is transmitted;

outputting a first inspection speech in a call connected state with an arbitrary telephone number in the phonebook list and determining whether a call sound is transmitted and received based on the first inspection speech;

outputting a second inspection speech to the integrated multimedia of the vehicle through the short range wireless communication and determining whether the short range wireless communication is performed based on the second inspection speech; and

releasing the pairing with the integrated multimedia of the vehicle through the short range wireless communication.

**13.** The inspection method of claim 12, wherein the step of requesting the pairing with the integrated multimedia of the vehicle through short range wireless communication includes steps of:

requesting address information of the integrated multimedia of the vehicle through the wireless connector;

receiving the address information from the integrated multimedia of the vehicle through the wireless connector; and

requesting pairing with the integrated multimedia of the vehicle through the short range wireless communication using the address information.

**14.** The inspection method of claim 12, wherein the step of determining whether the call sound is transmitted and received includes steps of:

outputting the first inspection speech to a microphone of the vehicle;

receiving the first inspection speech from the integrated multimedia of the vehicle through the short range wireless communication;

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comparing the output first inspection speech with the received first inspection speech; and

determining that the call sound is transmitted and received through the short range wireless communication when the output first inspection speech is the same as the received first inspection speech.

**15.** The inspection method of claim 12, wherein the step of determining whether the short range wireless communication is performed includes steps of:

transmitting the second inspection speech to the integrated multimedia for the vehicle in the state in which the communication terminal is paired with the integrated multimedia of the vehicle through the short range wireless communication;

receiving the second inspection speech from a speaker of the vehicle;

comparing the output second inspection speech with the received second inspection speech; and

determining that the short range wireless communication is performed when the output second inspection speech is the same as the received second inspection speech.

**16.** The inspection method of claim 12, further comprising a step of,

recognizing an identification code of the vehicle prior to the performing of the pairing with the integrated multimedia of the vehicle through the short range wireless communication.

**17.** The inspection method of claim 12, further comprising a step of, storing an inspection result including at least one of a determination result of whether the phonebook is transmitted, a determination result of whether the call sound is transmitted and received, and a determination result of whether the short range wireless communication is performed after determining whether the short range wireless communication is performed.

**18.** A non-transitory computer readable medium including instructions which causes a communication terminal to perform the steps of the inspection method of claim 12.

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